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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,883	07/26/2001	Michael R. Bruce	AMDA.508PA	7504

7590 11/14/2002
Crawford PLLC
Suite 390
1270 Northland Drive
St. Paul, MN 55120

EXAMINER

CHAN, EMILY Y

ART UNIT	PAPER NUMBER
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2829

DATE MAILED: 11/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/915,883

Applicant(s)

BRUCE ET AL.

Examiner

Chan, Emily

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Applicants' IDS (information disclosure information) filled on 3/25/02 was received, but was not accompanied by a copy of the references. Therefore, it was not considered. Applicants are required to send copies of the references. Please also send a copy of application Serial NO.09/520,597 mentioned on page 12.

Claim s 1-10 are presented for examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 2, 4, 6, 15 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 2, it is unclear what the "near a failure condition" is related to and how the " near a failure condition" is detected.

As per claim 4, the functional operation of " continuous loop at a near failure condition" is not understood.

As per claim 6, "free carriers and phonons" lacks of antecedent basis. Mainly where they come from are not specified.

As per claim 15, "averaging the images" is unclear and it is unclear how it would be obtained.

As, per claim 17, the term "possible" makes it unclear where the heat transfer happens or not, therefore, it should be deleted.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-16, and 18-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruce et al ('014) in view of Channin ('199).

With respect to claims 1, 11, 18 and 20-21, Bruce et al ('014) substantially disclose (see Fig. 4) a method and a system below for analyzing an Integrated circuit die (20) having a back side opposite circuitry at a circuit side as claimed comprising:

Directing a NIR laser light (see claim 13) at circuitry in the die (20) by means (108, 206, 208, 210, 212, 214, 216) under test (20) and generating heat at the circuitry; and

detecting a defect in the die (20) by means (110).

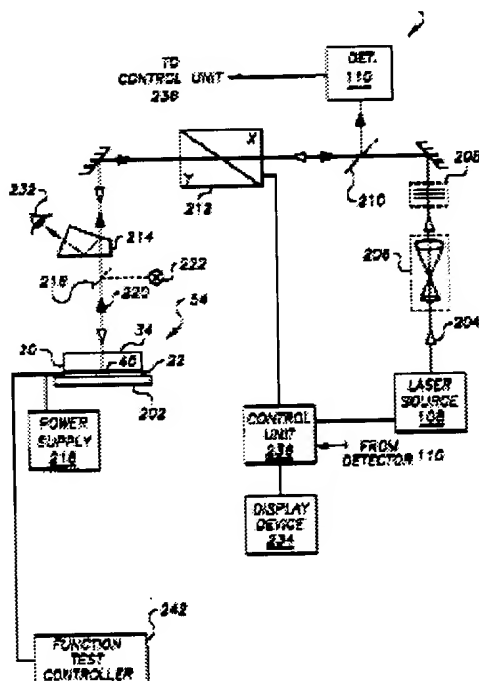


Fig. 4

Bruce et al ('014) do not disclose a liquid crystal layer formed over a portion of the die as claimed. However, Chinning ('199) expressly teaches (see Abstract) to coat a liquid crystal layer over an IC circuit for detecting the defect of the circuit due to the optical phase changes in the layer of liquid crystal (column 1, lines 23-24). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied the liquid crystal layer of Channing's ('199) onto the surface of Bruce et al ('014)'s die 20 in Bruce et al ('014)'s analyzing method and system because defect circuitry or unscribed wafers coated with a liquid crystal layer can be easily observed in numerous locations as disclosed by Channing ('199) (see col. 6, lines 18-20).

With respect to claim 2, Bruce et al ('014) disclose to add heat to the circuit (col. 4, lines 57-59).

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With respect to claim 3, Channin ('199) discloses that liquid crystal approaches a threshold temperature at which the liquid crystal changed phase (col. 5 lines 30-39).

With respect to claim 4, Bruce et al ('014) clearly disclose operating the die in a continuous loop at a near failure condition (col. 7, line 26-35).

With respect to claims 5-6, Bruce et al ('014) disclose circuitry to absorb laser radiation (see Fig. 2, 40).

With respect to claim 7-8, Bruce et al ('014) disclose using laser light to image the die and using the image to identify the portion of circuitry (col. 5, 27-34).

With respect to claim 9, Bruce et al ('014) inherently teach converting light energy from the laser into heat energy because Bruce et al ('014) system is directed to analyzing temperature characteristics of the circuit by using a laser light, and which inherently includes the light to heat conversion.

With respect to claims 10, 13, 22, Bruce et al ('014) disclose laser scanning microscope (claim 22).

With respect to claim 12, Bruce et al ('014)'s laser light has a wavelength of about 1.3 microns i.e. 1300 nm (col. 5, line 61).

With respect to claims 14-16, Channin ('199)'s discloses imaging the liquid crystal and using the image to detect the defect of the liquid crystal changing phase (see Fig. 4, 62).

With respect to claim 19, Bruce et al ('014)'s laser source such as YAG is commonly Applied in a pulse mode.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bruce et al ('014) in view of Channin ('199) as applied to claims 1-16 and 18-24 above, and further in view of Fujita ('630).

Both Bruce et al ('014) and Chaain ('199) do not disclose the step of removing an amount of substrate from the die that makes heat transfer from the circuit to the liquid crystal.

Fujita ('630) exclusively teaches (see col.6 line 48-49) to remove part of insulating substrate for thinning the electrically conductive circuit board (see col. 8 line 21). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied the method of removing substrate taught by Fujita ('630) in Bruce et al ('014)'s and Channin ('199)'s system to have the claimed step of removing an amount of substrate from the die because good compliance characteristics with thinned electrically conductive circuit board can be obtained as disclosed by Fujita ('630) (see col.8, lines 22-23).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emily y chan whose telephone number is 7033056123. The examiner can normally be reached on 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cunieo kam can be reached on 7033081233. The fax phone numbers for the organization where this application or proceeding is assigned are 7033085841 for regular communications and 7033085841 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 7022056123.

ec

November 4, 2002



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